

ABSTRACT

[0123] The present methods and apparatus concern the detection and/or identification of target analytes using probe molecules. In various embodiments of the invention, the probes or analytes are attached to one or more cantilevers. Binding of a probe to an analyte results in deflection of the cantilever, detected by a detection unit. A counterbalancing force may be applied to restore the cantilever to its original position. The counterbalancing force may be magnetic, electrical or radiative. The detection unit and the mechanism generating the counterbalancing force may be operably coupled to an information processing and control unit, such as a computer. The computer may regulate a feedback loop that maintains the cantilever in a fixed position by balancing the deflecting force and the counterbalancing force. The concentration of analytes in a sample may be determined from the magnitude of the counterbalancing force required to maintain the cantilever in a fixed position.